APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/707,874	11/07/2000	Arthur J. Redfern	TI-31367	9752

23494   7590   01/16/2004

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EXAMINER
PERILLA, JASON M

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 01/16/2004

2

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.		Applicant(s)	
Office Action Summary	09/707,874		REDFERN, ARTHUR J.	
	Examiner		Art Unit	
	Jason M Perilla		2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 November 2000*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 8-13* is/are rejected.

7)☒ Claim(s) *4-7 and 14-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07 November 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

    a)☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4)☐ Interview Summary (PTO-413) Paper No(s). _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other:

DETAILED ACTION

1.   Claims 1-16 are pending in the instant application.

Drawings

2.   This application, filed under former 37 CFR 1.60, lacks formal drawings. The

informal drawings filed in this application are acceptable for examination purposes.

When the application is allowed, applicant will be required to submit new formal

drawings.

Claim Rejections - 35 USC § 112

3.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

4.   Claims 8-12 are rejected under 35 U.S.C. 112, second paragraph, as being

indefinite for failing to particularly point out and distinctly claim the subject matter which

applicant regards as the invention.

Regarding claim 8, the arguments $\mu(t)$ and $e(t)$ in the equation of line 3 that

defines $g(n)$ are not defined in the claim. Therefore, the claim is found to be indefinite.

When using an equation as a claim limitation, all of the arguments of the equation

should be clearly defined in the claim itself.

Regarding claims 9, $\mu(t)$ is not defined in this child claim of parent claim 8.

Hence, claim 9 is indefinite because one is unable to distinctly determine what is being

claimed.

Regarding claim 10, $\mu(t)$ is limited to be determined by $R = E[Y(k(n),t)Y(k(n),t)^H]$ in

line 3. However, one is unable to determine how $R = E[Y(k(n),t)Y(k(n),t)^H]$ can be utilized

to determine $\mu(t)$ because it is not an argument of the equation. The value(s) of $\mu(t)$ are

seemingly independent of the definition $\mathbf{R}=E[\mathbf{Y}(\mathbf{k}(n),t)\mathbf{Y}(\mathbf{k}(n),t)^H]$. Further, the value of

$e(t)$ it yet undefined.

Regarding claim 11, $\mu(t)$ is limited as defined by $u(t) = \dfrac{\alpha}{\beta + Y(k(n),t)^H Y(k(n),t)}$ in

line 3, and the ranges of α and β are defined. However, the units of α and β are not

defined. Hence, the evaluation of $\mu(t)$ is not definite and can not be determined

because one does not know what α and β are. Further, the value of $e(t)$ it yet

undefined.

Regarding claim 12, $\mu(t)$ is limited as defined by $u(t) = \dfrac{\alpha}{\sigma^2(t)}$ where

$\sigma^2(t) = c\sigma^2(t-1) + |e(t)|^2$, $c \in (0,1)$, and $0 < \alpha < \dfrac{2}{M}$. However, the values and units of c,

$e(t)$, and M are undefined. Hence, the evaluation of $u(t)$ can not be determined and it is

found to be indefinite.

Claim Rejections - 35 USC § 102

5.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6.   Claims 1-3, and 13 are rejected under 35 U.S.C. 102(a) as being anticipated by

Johnson et al (6047025).

Regarding claim 1, Johnson et al discloses a method of canceling communication system noise interference comprising the steps of (a) receiving blocks of data (fig. 2; col. 3, lines 30-33), (b) determining the set of sub-channels or the sub-channel for the frequency domain equalizer (FEQ) (col. 8, lines 62-64), (c) generating multi-channel FEQ coefficients for the sub-channel used to transmit the data (col. 9, lines 2-18; col. 10, lines 64-66), and (d) performing multi-channel FEQ for the sub-channel using the generated multi-channel FEQ coefficients (col. 6, lines 14-19).

Regarding claim 2, Johnson et al disclosed the limitations of claim 1 as applied above. Further, Johnson et al discloses the method of claim 1 wherein the steps of b-d are repeated for each sub-channel used to transmit data (col. 8, line 61 – col. 9, line 5). Because there is a one tap FEQ for each sub-channel, it is inherent that the steps of b-d of claim 1 above are repeated or performed for each sub-channel used in the communications system.

Regarding claim 3, Johnson et al disclose the limitations of claim 1 as applied above. Further, Johnson et al discloses that the set of sub-channels for finding the FEQ coefficients for sub-channel *n* includes sub-channel *n* (col. 8, lines 62-66). Because each equalizer operates on exactly one sub-channel of the FFT, it is this sub-channel that is included for finding the coefficients of the sub-channel.

Regarding claim 13, Johnson et al disclose a system for canceling communication system noise interference comprising a multi-channel FEQ receiving blocks of data (fig. 2; col. 3, lines 30-33) transmitted over predetermined sub-channels wherein the multi-channel FEQ is operational to generate multi-channel FEQ

coefficients (col. 9, lines 2-18; col. 10, lines 64-66) associated with the sub-channel

used to transmit the data (col. 8, lines 61-66), and further wherein the FEQ coefficients

are associated with a set of sub-channels for the sub-channel used to transmit the

blocks of data (col. 8, lines 61-66). The associated set of sub-channels used to

generate the FEQ coefficients for a single sub-channel is composed of the sub-channel

itself. The noun "set" as used to limit the number of sub-channels n evaluated to find

the FEQ coefficients for the nth sub-channel has a dictionary definition of "a number of

things" and does not necessarily imply a plurality. The instant interpretation of the noun

"set" is -one-.

Allowable Subject Matter

7.   Claims 4-7 and 14-16 are objected to as being dependent upon a rejected base

claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims.

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. The following prior art of record not relied upon above is cited to

further show the state of the art with respect to multi-channel FEQ equalizers.

> U.S. Pat. No. 6097763 to Djokovic et al; Reduction of RFI in a DMT modulation
>
> system by convergence of a windowed set of samples in a particular sub-channel
>
> for generation of FEQ coefficients.
>
> U.S. Pat. No. 6005893 to Hyll; A DMT modulation system utilizing a FEQ
>
> equalizer.

U.S. Pat. No. 5901180 to Aslanis et al; A DMT modulation system utilizing a FEQ equalizer.

"Per tone equalization for DMT receivers"; *Van Acker, K.; Leus, G.; Moonen, M.; van de Wiel, O.; Pollet, T.;* Global Telecommunications Conference GLOBECOM '99, Volume: 5, 1999; Page(s): 2311 -2315 vol.5.

9.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

Jason M Perilla
December 17, 2003

jmp

STEPHEN CHIN
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